

ABSTRACT OF THE INVENTION

[00106] In a system for cleaning a workpiece or wafer, a boundary layer of heated liquid is formed on the workpiece surface. Ozone is provided around the workpiece. The ozone diffuses through the boundary layer and chemically reacts with contaminants on the workpiece surface. A jet of high velocity heated liquid is directed against the workpiece, to physically dislodge or remove a contaminant from the workpiece. The jet penetrates through the boundary layer at the point of impact. The boundary layer otherwise remains largely undisturbed. Preferably, the liquid includes water, and may also include a chemical. Steam may also be jetted onto the workpiece, with the steam also physically removing contaminants, and also heating the workpiece to speed up chemical cleaning. The workpiece and the jet of liquid are moved relative to each other, so that substantially all areas of the workpiece surface facing the jet are exposed at least momentarily to the jet. Sonic or electromagnetic energy may also be introduced to the workpiece.